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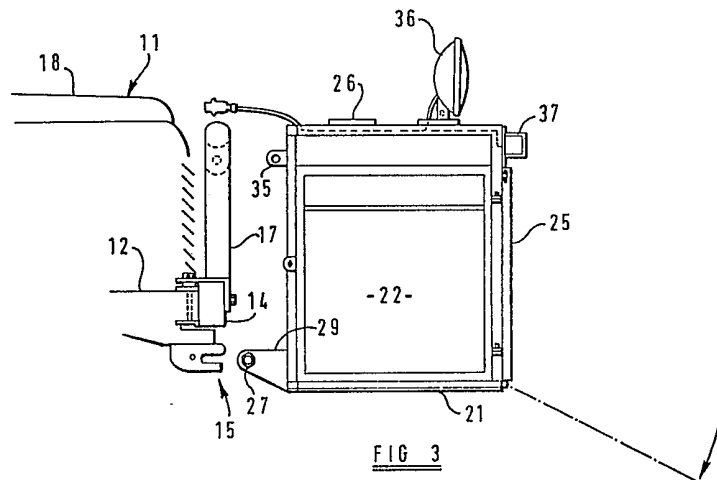
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(54) Motor vehicle with front end connection devices

(57) A carrier is releasably mounted to connectors (15) on the front of a motor vehicle. The carrier has a floor (21) below the level of the vehicle body (11) and is suitable for carrying animals or articles which cannot easily be loaded into a compartment defined by the vehicle body. The connectors may be used for attachment of other assemblies such as winches and snow ploughs.



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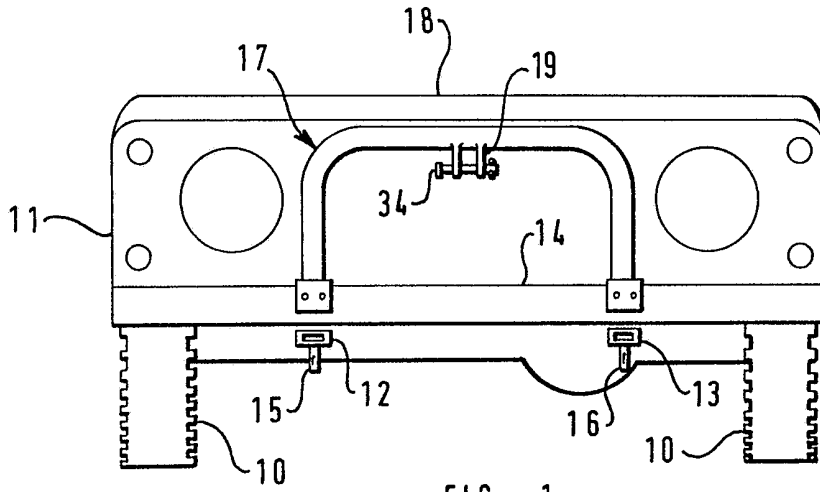


FIG 1

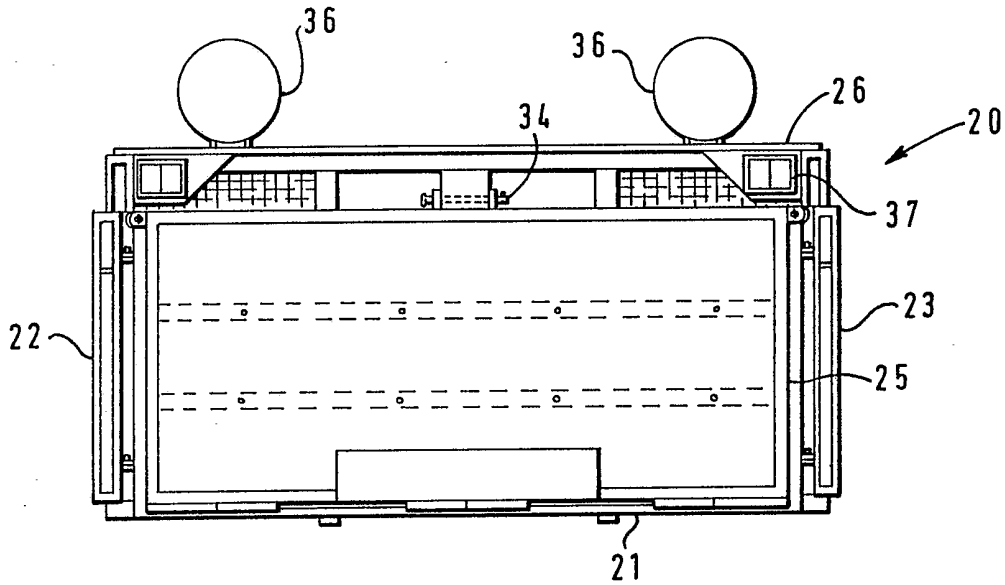


FIG 2

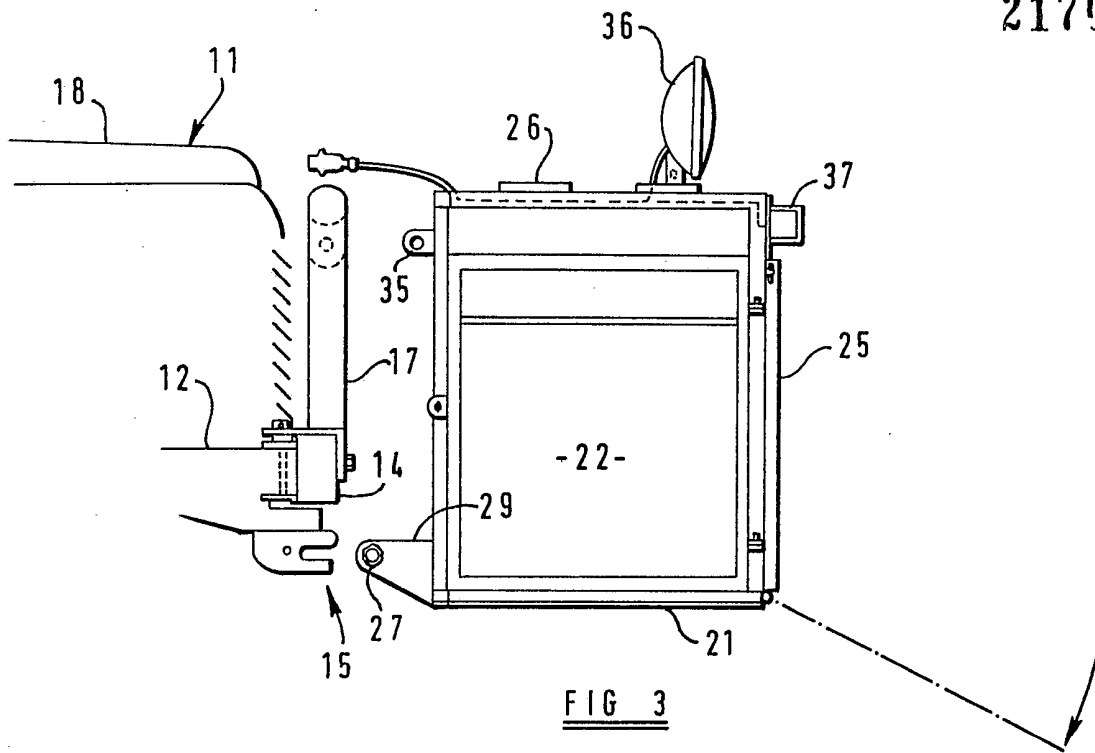


FIG 3

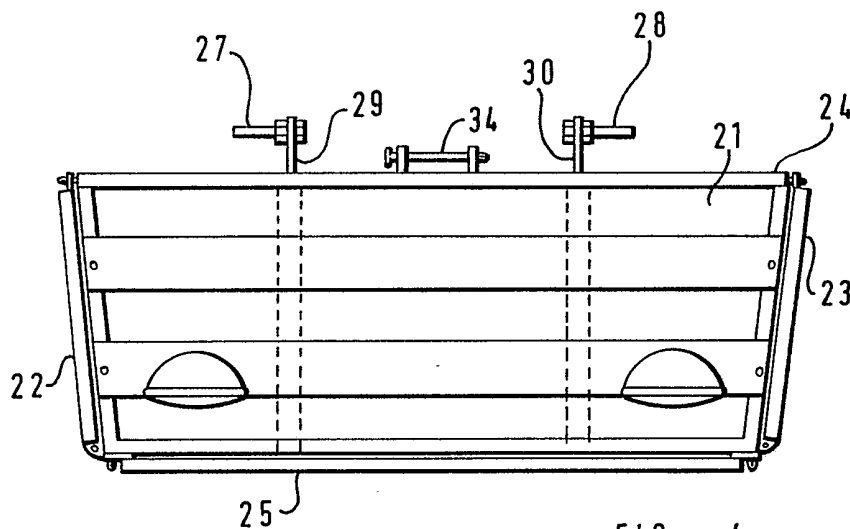


FIG 4

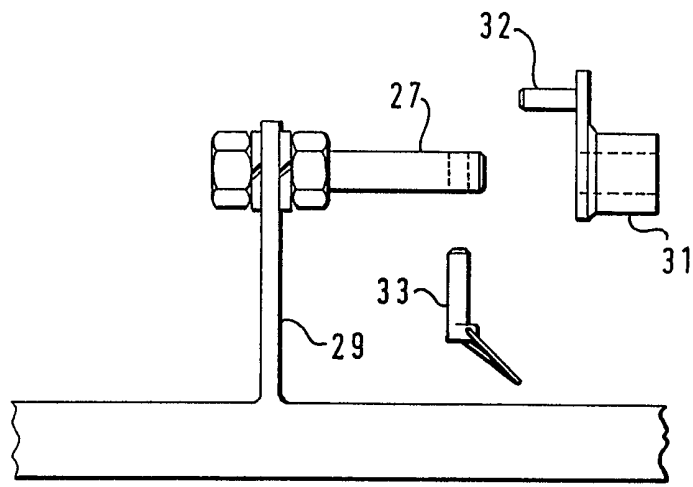


FIG 5

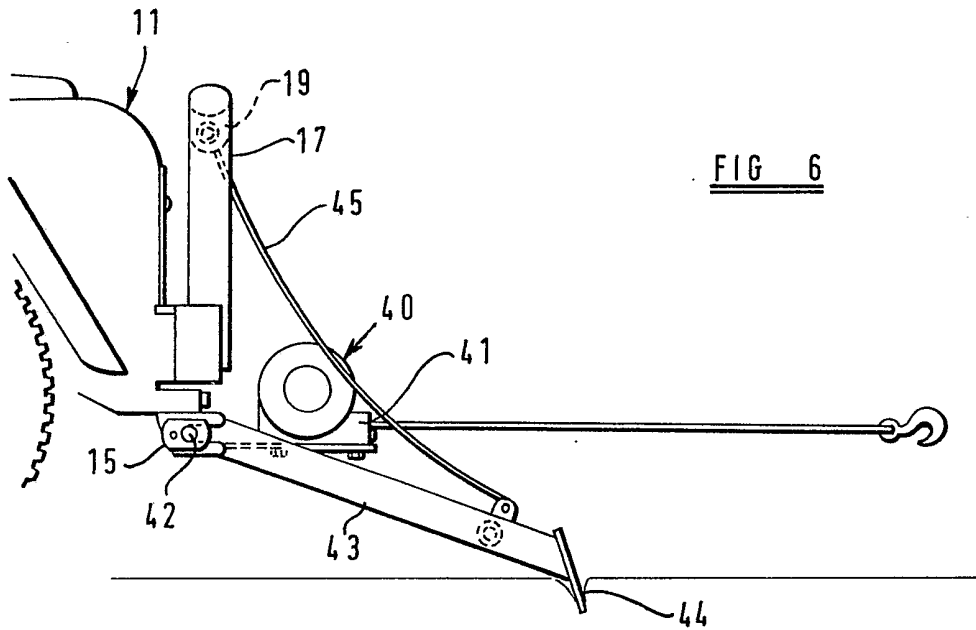


FIG 6

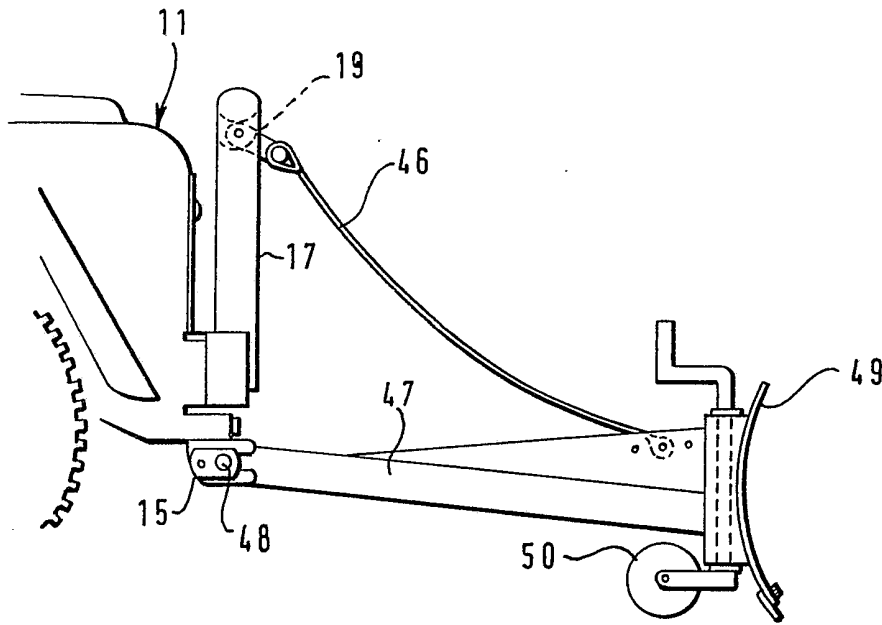


FIG 7

## SPECIFICATION

**Motor vehicle**

5 According to a first aspect of the invention, there is provided a motor vehicle comprising a body/chassis structure supported on a pair of steerable front wheels and on rear wheels, and a pair of connectors which are fixed with respect to the body/chassis structure, wherein the connectors are disposed at a front of the vehicle, the connectors are spaced apart laterally of the vehicle and each connector comprises a pair of jaws defining between them a forwardly facing mouth. There is preferably combined with the vehicle an attachment having connecting elements received in respective ones of said connectors. Each connecting element may be a pin which, when positioned between the jaws of a corresponding connector, can rotate relative to the connector about an axis which is substantially parallel to a rear wheel axis of the vehicle.

The preferred vehicle further comprises a support which extends upwardly from a lower part of the chassis/body structure at the front of the vehicle for connection with the attachment near to an upper end of the support.

According to a second aspect of the invention, there is provided a motor vehicle comprising a body/chassis structure supported on a pair of steerable front wheels and on rear wheels, a support mounted on said structure in a fixed position with respect to the structure and being at the front of the vehicle and a carrier including a floor and sides, the carrier being releasably attached to the support and projecting therefrom in a direction forwardly of the vehicle.

An example of a vehicle embodying both aspects of the invention will now be described, with reference to the accompanying drawings, wherein:-

40 *Figure 1* shows a front elevation of a pair of the vehicle, a carrier being omitted.

*Figure 2* shows a front elevation of the carrier alone;

45 *Figure 3* shows a side elevation of a part of the vehicle and a side elevation of the carrier, the carrier being separated from the vehicle;

*Figure 4* shows a plan view of the carrier alone;

50 *Figure 5* shows, on an enlarged scale, a plan view of certain parts connecting the carrier with the remainder of the vehicle;

*Figure 6* shows an alternative attachment mounted on the vehicle; and

*Figure 7* shows a further alternative attachment mounted on the vehicle.

55 The vehicle illustrated in the accompanying drawings is a four-wheeled vehicle comprising a pair of rear wheels (not shown) and a pair of steerable front wheels 10 supporting a chassis/body structure 11. This structure includes a pair of elongated chassis members 12, 13 which are spaced apart laterally of the vehicle, constitute a lower part of the structure and extend longitudinally of the vehicle. A bumper 14 is mounted on front end portions of the members 12 and 13.

65 There are mounted on respective ones of the

70 chassis members 12 and 13, at positions below and to the rear of the bumper 14, a pair of connectors 15, 16. The connectors are rigid with respect to the structure 11 and may be welded to respective ones of the members 12 and 13. A support 17 is rigidly connected with the structure 11, either directly or indirectly to the chassis members 12 and 13, and extends upwardly from the bumper to a position which is slightly below a level of an upwardly facing surface of a bonnet 18 of the vehicle. A third connector 19 is provided on the uppermost part of the support 17.

75 The vehicle shown in figures 1 to 5 further comprises a carrier 20 which includes a generally flat floor, sides 22 and 23, a rear wall 24 and a front wall 25, all extending upwardly from respective margins of the floor. The carrier has a top wall 26 which lies at a level not significantly above, and preferably slightly below the level of the highest part of the bonnet 85 18.

When the vehicle stands on horizontal ground, the floor 21 of the carrier is horizontal and lies at a level below that of the bumper 14 and below the level of the lowest part of the chassis/body structure 11. The floor 21 is, however, spaced upwardly from the ground by a substantial distance, so that it will remain clear of the ground when the vehicle is driven over moderately uneven ground. The floor is preferably above the level of the axis of rotation of each of the front wheels 10. The front wall 25 is connected with the floor 21 by a hinge so that the front wall can form a ramp leading from the ground into the carrier. One or both of the sides 22 and 23 may be formed as or may incorporate a door. The or each such door may be hinged for movement above a substantially upright axis or for movement about a horizontal axis adjacent to its lower edge, so that the door also can form a ramp. It will be noted that the carrier 20 occupies a position forwardly of the chassis-body structure 11 so that other parts of the vehicle do not impede loading into and from the carrier.

At the rear of the carrier 20, there is provided a pair of connecting elements 27, 28, each in the form of a pin arranged with its longitudinal axis horizontal and extending transversely of the vehicle. The pins 27 and 28 are spaced rearwardly from the rear wall 24 of the carrier and are connected therewith by respective brackets 29, 30. Each of the connectors 15 and 16 comprises a respective pair of jaws between which a corresponding one of the pins 27 and 28 is received. On an end portion of the pin 27 remote from the bracket 29, there is carried a bush 31 coupled by an eccentric pin 32 with the adjacent connector 15. The bush 31 is retained on the end portion of the pin 27 by a removable linch clip 33. The eccentric pin 32 is received in an opening in the connector 15 and prevents the bush 31 moving longitudinally of the jaws, towards the open end of the connector defined by the jaws. The connecting pin 27 is free to rotate about its own axis in the bush 31 and relative to the connector 15. The pin 28 is releasably secured in the connector 16 in a corresponding manner.

130 A third connecting element, 34, is provided on the

carrier 20 for co-operation with the connector 19 on the support 17. The connecting element 34 is a removable pin which extends through aligned apertures in the connector 19 and in a bracket 35

5 provided on and projecting rearwardly from the rear wall 24 of the carrier. The connecting pin 34 lies at a level considerably above the level of the connecting pins 27 and 28 and near to the top wall 26 of the carrier. As shown in the drawings, the connecting  
10 pin 34 is preferably positioned slightly forwardly of the connecting pins 27 and 28.

The rear wall 24 of the carrier may be formed, at least partly, of mesh or other material which permits illumination of the interior of the carrier by lights  
15 incorporated in the chassis/body structure 11. Since the carrier will obstruct proper illumination of the ground in front of the vehicle by these lights, additional lights 36 may be provided on the carrier. The drawing also shows a unit 37 on the carrier  
20 comprising stop and side lights. These lights are connected electrically into lighting circuits of the vehicle by conductors which include a releasable plug and socket.

The carrier 20 can be dismantled from the chassis/body structure 11 of the vehicle by withdrawing the connecting pin 34 and permitting the carrier to pivot downwardly about the axis of the connecting pins 27 and 28 until a lower, front part of the carrier rests on the ground. The carrier is then preferably  
30 supported adjacent to the rear margin of the floor 21 from the ground by a separate support placed on the ground or by legs (not shown) temporarily fitted onto the carrier. Once the carrier has been supported on the ground in this way, the bush 31 can be  
35 withdrawn from the connecting pin 27, the corresponding bush withdrawn from the connecting pin 28 and the vehicle then reversed away from the carrier. The support 17 and connectors 15 and 16 would normally remain on the chassis/body structure during  
40 use of the vehicle without the carrier. The connecting pins 27, 28 and 34 may be used for mounting the carrier on another vehicle. Remounting of the carrier on the chassis/body structure of the vehicle illustrated in the drawing is carried out by  
45 reversing the dismantling procedure.

The carrier 20 may be used for carrying a device which is powered from an engine (not shown) of the vehicle, for example via a front power-take-off shaft. In a case where the carrier is intended for this  
50 purpose only, the carrier may be modified, for example to reduce the size of the carrier.

In Figure 6, the vehicle shown in Figures 1 to 5 is illustrated with an alternative attachment, namely a winch. The winch 40 is mounted on a platform 41  
55 provided with a pair of pins 42 corresponding to the pin 27 and 28 of the carrier 20. The pins 42 are engageable in respective ones of the connectors 15 and 16 in a manner to permit pivoting of the platform 41 relative to the chassis/body structure of the  
60 vehicle. Bushes 31 are used to retain the pins 42 in the connectors whilst the winch is mounted on the vehicle body.

The winch platform 41 is further provided with one or a pair of legs 43 which, when the winch is  
65 mounted on the vehicle body as shown in figure 6,

extend forwardly and downwardly from the winch platform 41 to the ground. At the free end of the or each leg, there is provided a plate 44 which is adapted to penetrate into the ground and impede  
70 forward movement of the winch and vehicle during use of the winch. Engagement of the plate with the ground limits downward pivoting of the winch about the axis of the pin 42.

The or each leg 43 is also linked with the support  
75 17 by a chain or other flexible link 45 which can be used to hold the plate 42 clear of the ground when the vehicle is being driven and which will also limit downward pivoting of the winch relative to the vehicle body. The connection between the link 45  
80 and at least the support 17 is releasable. The pins 42 can be engaged in and withdrawn from the connectors 15, 16 in the manner hereinbefore described.

In figure 7, there is illustrated a snow plough attached to the vehicle by means of the connectors  
85 15 and 16 and a chain or other flexible link 46. The snow plough comprises a frame 47 provided with two pins 48 corresponding to the pins 27 and 28 of the carrier 20. At a side of the frame remote from the pins 48, there is mounted a blade 49 which may be  
90 inclined at an acute angle to the direction of travel of the vehicle. The chain 46 extends between the support 17 and the frame 47 at a position near to the blade 49.

There are also mounted on the frame 47 a pair of  
95 ground-engaging wheels 50 which limit downward pivoting of the frame 47 about the axis of the pin 48 when the snow plough is in use. As shown, means may be provided for raising and lowering the wheel 50 relative to the frame and maintaining the wheel in  
100 a position to which it has been adjusted.

By means of the chain 46, the snow plough can be suspended with the wheels 50 and the blade 49 raised clear of the ground. Engagement of the pins 48 with the connectors 15 and 16 and release of the  
105 pins from those connectors is carried out in the manner hereinbefore described.

The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed  
110 function, or a method of process for attaining the disclosed result, as appropriate, may, separately or any combination of such features, be utilised for realising the invention in diverse forms thereof.

## 115 CLAIMS

1. A vehicle comprising a body/chassis structure supported on a pair of steerable front wheels and on rear wheels and a pair of connectors which are fixed  
120 with respect to the body/chassis structure, are spaced from each other laterally of the vehicle and are disposed at a front of the vehicle, wherein each connector comprises a pair of jaws defining a  
125 forwardly facing mouth.

2. A vehicle according to Claim 1 wherein each connector is provided with a releasable retaining element for retaining a pin between the jaws, when  
inserted therebetween.

130 3. A vehicle according to Claim 2 wherein the

retaining element is a bush having an eccentric pin to engage in an aperture formed in the connector.

4. A vehicle according to any preceding Claim wherein each connector is spaced forwardly from the front wheels of the vehicle.

5. A vehicle according to any preceding Claim further comprising a support mounted on the body/chassis structure at the front of the vehicle, the support extending upwardly from a lower part of the chassis/body structure to a position spaced substantially above the connectors.

6. A vehicle according to any preceding Claim in combination with an attachment having connecting elements received in respective ones of said connectors.

7. A combination according to Claim 6, as appendant to Claim 5 wherein there is also a releasable, rigid connection between the attachment and said support.

8. A combination according to Claim 6 as appendant to Claim 5 wherein there is provided between said support and the attachment a link which permits limited pivoting of the attachment relative to the body/chassis structure about an axis defined by said connecting elements.

9. A combination according to Claim 8 wherein said attachment further comprises means remote from the connectors for supporting the attachment directly on the ground, the attachment being pivotable relative to the body/chassis structure about an axis which passes through the mouth of both connectors.

10. A motor vehicle comprising a body/chassis structure supported on a pair of steerable front wheels and on rear wheels, a support mounted on said structure in a fixed position with respect to the structure at the front of the vehicle and a carrier including a floor and sides, the carrier being releasably attached to the support and projecting therefrom in a direction forwardly of the vehicle.

11. A vehicle according to Claim 10 further comprising connectors fixed on said structure at respective positions spaced apart laterally of the vehicle, wherein the carrier is provided with connecting elements fixed with respect to the floor of the carrier and releasably engaged with the connectors.

12. A vehicle according to Claim 11 wherein each of said connectors includes a pair of jaws, between which a respective one of said connecting elements is received.

13. A vehicle according to Claim 12 wherein each connector further includes a retainer engaged with said respective one of the connecting elements to hold the element releasably between the jaws.

14. A vehicle according to Claim 13 wherein each connecting element is a pin and the retainer is a bush coupled with the jaws and through which the pin extends.

15. A vehicle substantially as herein described with reference to and as shown in figures 1 to 5 of the accompanying drawings.

16. A vehicle as claimed in Claim 15 modified substantially as herein described with reference to and as shown in Figure 6 or Figure 7 of the accompanying drawings.

17. Any novel feature or novel combination of features disclosed herein or in the accompanying drawings.

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